

CLAIM AMENDMENTS

1. (Currently Amended) A method of representing an object appearing in a still or video image, by processing signals corresponding to the image, the method comprising:

deriving a curvature scale space (CSS) representation of the object outline by smoothing the object outline,

deriving at least one additional parameter reflecting the shape or mass distribution of a smoothed version of the original curve, and

associating the CSS representation and the additional parameter as a shape descriptor of the object, wherein the at least one additional parameter corresponds to the eccentricity of the outline.

2. (Original) A method as claimed in claim 1 wherein an additional parameter relates to the smoothed outline corresponding to a peak in the CSS image.

3. (Original) A method as claimed in claim 2 wherein an additional parameter relates to the smoothed outline corresponding to the highest peak in the CSS image.

Claims 4-5 (canceled).

6. (Currently Amended) A method as claimed in ~~any one of~~ claim[[s]] 1 [[to 5]] wherein at least one additional parameter uses a region-based representation.

7. (Original) A method as claimed in claim 6 wherein an additional parameter is a region moment invariant.

8. (Currently Amended) A method as claimed in claim 6 ~~or claim~~ 7 wherein an additional parameter is based on Fourier descriptors.

9. (Original) A method as claimed in claim 6 wherein an additional parameter is based on Zernike moments of the region enclosed by the outline.

10. (Currently Amended) ~~A method of representing a plurality of objects appearing in a still or video image, by processing signals corresponding to the images, the method comprising,~~
~~for each object outline, determining if there are significant changes in curvature in the object outline, and,~~
~~if there are significant changes in curvature of the object outline, then deriving a shape descriptor using a method as claimed in any one of claims 1 to 9 and,~~
~~if there are no significant changes in curvature of the object~~

~~outline, then deriving a shape descriptor including at least said additional parameter reflecting the shape of the object outline~~

A control device for representing an object appearing in an image by processing signals corresponding to the image, comprising:

a controller for performing the steps of:

deriving a curvature scale space (CSS) representation of an object outline by smoothing the object outline,

deriving at least one additional parameter reflecting shape or mass distribution of a smoothed version of original curve for the object outline, and

associating the CSS representation and the additional parameter as a shape descriptor of the object, wherein the at least one additional parameter corresponds to the eccentricity of the outline.

11. (currently amended) A method as claimed in claim 10 wherein the additional parameter for an object outline ~~having no significant changes in curvature~~ is based on region moment invariants, Fourier descriptors or Zernike moments of the outline

Claims 12-23 (canceled).

24. (New) A control device for deriving a representation of an object in an image which is programmed to perform the method as claimed in claim 1.

25. (New) An apparatus for deriving a representation of an object in an image comprising a control device as claimed in claim 24 and storage area for storing images and/or representations of images.

26. (New) An apparatus as claimed in claim 25 wherein the storage area is an image database and/or a descriptor database.

27. (New) An apparatus as claimed in claim 25 or claim 26 further comprising a display.

28. (New) A method for representing an object appearing in an image, comprising:

determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of said outline to generate a shape descriptor for said outline.

29. (New) The method of claim 28, further comprising:

storing said shape descriptor as a description for said object in a memory.

30. (New) The method of claim 28, wherein said determining a curvature scale space representation includes determining zero crossing points for an initial set of curves generated to produce said plurality of curves representative of said outline.

31. (New) A method for identifying an outline of an object, comprising:

identifying an object outline as a shape descriptor and storing said outline in a memory, wherein said identifying includes:

determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed portion of said outline to generate said shape descriptor for said outline.

32. (New) A method for recovering an outline of an object appearing in an image, comprising:

recovering an object outline from a shape descriptor wherein said shape descriptor being generated by:

determining a curvature scale space representation for

an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed portion of said outline to generate said shape descriptor for said outline.

33. (New) A method for propagating a signal, comprising:

generating a signal including a plurality of video images wherein said images include a plurality of objects having outlines; and

encoding said objects onto said signal using a description language to define at least a shape descriptor generated using a curvature scale space representation for an object outline, including a plurality of fields, for at least one selected object wherein said fields include a field representing the eccentricity of said outline.

34. (New) A system for representing an object appearing in an image, comprising:

a controller and a detector for determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline;

wherein said controller to determine characteristics

associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of said outline to generate a shape descriptor for said outline; and

a memory for storing said shape descriptor as a description for said object in a memory.

35. (New) A system for recovering an outline of an object, comprising:

a controller and a detector for recovering an object outline from a shape descriptor, wherein said controller and detector to determine a curvature scale space representation for said object outline to generate a plurality of curves representative of said outline;

wherein said controller to determine characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed portion of said outline to generate said shape descriptor for said outline; and

a memory for storing said shape descriptor as a description for said object in a memory.

36. (New) A machine-readable medium having stored thereon a plurality of executable instructions, the plurality of instructions comprising instructions to:

determine a curvature scale space representation for an

object outline to generate a plurality of curves representative of said outline;

determine characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of said outline to generate a shape descriptor for said outline; and

store said shape descriptor as a description for said object in a memory.